

## ABSTRACT

The invention relates to a method for transmitting at least one first and second data signal in polarization multiplex. To this end, the invention provides that, in a first step, the first data signal is, on the transmit side, modulated to a sideband of a first carrier signal for generating a first sideband-modulated signal, and the second data signal is modulated to a sideband of a second carrier signal in order to generate a second sideband-modulated signal. In a second step, the first and second sideband-modulated signal are subsequently polarized orthogonal to one another, combined to form an optical multiplex signal and transmitted. In a third step, the optical multiplex signal is, on the receive side, guided via a polarization control element to a polarization splitter that separates the transmitted optical multiplex signal into the first and second sideband-modulated signal. In a fourth step, the first sideband-modulated signal is converted into a first electrical signal and/or the second sideband-modulated signals are/is converted into a second electrical signal. In a fifth step, the first and/or second electrical signal are/is evaluated and at least one control signal for controlling the polarization control element is derived on the basis of this evaluation.